

## **4. ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES**

Chapter 4 addresses primary, direct, induced, secondary and cumulative impacts of the Proposed Action and No Action Alternatives. Beneficial and adverse, on-site and off-site, construction, operation, and maintenance impacts are also described, as appropriate.

The analyses focus on overall site development impacts and differentiate impacts from the short-term vs. long-term scenarios, where appropriate. Specific impacts from individual improvements (buildings, machines, devices, equipment, tools) are provided only where appropriate to clarify a unique environmental situation or consequence of a specific program element. Comparisons between various optional elements of the Proposed Action (short-term only) are provided only if meaningful impact differences would result from implementation of the options and those differences can be clarified at this time.

The impact analyses presented in this chapter consider NREL's broad and extensive environmental commitments as described in Chapter 1, and refer to specific commitments, as appropriate, to characterize potential impacts and substantiate related impact findings.

### **4.1 LAND USE, PLANNING, PUBLIC POLICY, SOCIOECONOMICS**

#### **4.1.1 Land Use Impacts**

The proposed short-term and long-term improvements of the Proposed Action would have minor on-site and off-site land use impacts, but each improvement would be subject to review under applicable programs, policies and procedures implemented by NREL at the NWTC intended to avoid and/or minimize impacts at the site. Sensitive areas of the NWTC are protected by various policies and practices and in most cases, the requirements pertaining to Conservation Management Areas. Designated corridors would be used for utility installation and restoration is required for surface disturbances.

Development of vacant land and improvements to existing facilities and buildings would allow for increased site activity. The development would involve research and development uses within the NWTC development area, adding new test sites and associated facilities within the test site area.

The primary short-term improvements would include:

- 5 new buildings,
- 3 large megawatt class turbines,
- 20 new test sites,
- Several large and small solar devices, and
- Utility upgrades including some off-site improvements.

The long-term improvements would add more buildings, building additions and/or taller buildings, along with two additional megawatt class turbines. A total of 50,000 square feet of interior space would be added.

Foundations for the five 5-megawatt class turbines could require up to about 0.65 acres of land in the test site area if the larger (75 feet x 75 feet or 22.7 meters by 22.7 meters) foundation designs were used.

The proposed land uses are consistent with current uses. Proposed building designs would be reasonably consistent with existing development, and the anticipated improvements would create no land use conflicts, compatibility issues, or other land use impacts. The long-term scenario suggests buildings could be as high as 75 feet (22.7 meters), which is approximately 25 feet (7.6 meters) taller than Building 251. Higher density in the development area and increased use in the test site area for research and development purposes involving renewable energy facilities, such as wind turbines and solar devices, would be entirely consistent with the mission of the NWTC.

The proposed short-term and long-term site development would have little or no land use impacts on surrounding areas. Growth inducement and related impacts associated with site development would not be expected or would be quite limited because the NWTC provides on-site facilities for related private sector ventures. The impacts from any growth induced by site development would not be considered significant for this reason and because much of the site is surrounded by dedicated public open space so growth would be diverted to large underutilized commercial real estate and buildings located east of the site in the Interlocken Business Park and elsewhere. The demand for redevelopment of the adjacent aggregate mining sites and commercial and industrial sites would not be considered linked to NWTC activities or related site development.

Use of either natural gas line alignment (north or south) would have no substantive land use implications.

Construction of five megawatt-class turbines, more towers and/or higher towers requires coordination to address FAA requirements associated with Jefferson County Airport height restrictions for navigation and communication equipment. NREL complies with FAA requirements and would follow the FAA Form 7460 process, which relates to an air space analysis that would occur when new towers are actually proposed. Preliminary consultation with FAA indicates that approval of the anticipated towers would not be precluded, but certain lighting and other requirements would apply. Light fixture requirements are likely to be similar to existing fixtures, but it is possible they may be needed in multiple locations for the taller towers (Bauer, 2001). No unmitigated impacts would be anticipated.

#### **4.1.2 Compatibility with Applicable Local Plans, Policies and Anticipated Future Development**

Although the land use and zoning plans and policies of local governments are not applicable to federal lands, the following discussions address future conditions based on these plans, and characterize land use and planning issues that future on-site and off-site development may present.

The planned improvements would be consistent with local land use designations for the site and would be consistent with industrial zoning designations on adjacent parcels.

The NWTC's location was selected at time when future land use scenarios for surrounding properties were far different from current scenarios. In recent years, independent and

cooperative open space acquisitions by local governments have essentially isolated the NWTC from future urban development. This isolation prevents impacts associated with encroachment of urban development, but may create public access pressures, generate interest in on-site development proposals, and create pressure for long-term facility decommissioning activities.

Access pressures may be intensified because of development east of the designated open spaces located east of the site, substantial road improvements that will direct vehicles to Highway 128, and growing operations at and around Jefferson County airport. Increasing use of Highway 128, Highway 93 and open space trails, combined with increasing site visibility from office buildings to the east in Broomfield and Superior and other new development, may generate increased interest in site operations. None of these impacts would be considered significant or adverse.

#### **4.1.3 Social and Economic Impacts**

Executive Order 12898, enacted by President Clinton in 1993, requires that each federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

The Proposed Action would have no direct impacts on minority or low-income populations because no off-site human health or environmental effects of the proposed action are anticipated, and no minority or low-income populations are located in the vicinity of the site.

The Proposed Action would have direct and indirect economic impacts because it would create jobs and would involve substantial construction expenditures. In addition, a total of 300 employees might work at the NWTC under the long-term scenario estimates. The 220 new jobs, construction jobs and construction expenditures would incrementally increase local housing demands and corresponding economic activity in the vicinity. These indirect impacts would not be considered significant given far larger economic forces and activities, and might be considered beneficial by local governments pursuing economic development.

#### **4.1.4 Impacts of the No Action Alternative**

The No Action Alternative would allow existing on-site land uses, site development density and operations to remain as they are now. Installing and testing different kinds of turbines on the site would continue, but larger towers and turbines would not be added. Community development beyond nearby open spaces would still result in increased interest in the site and related activities. Fewer beneficial economic impacts would result because building construction would not occur and related job growth would be limited.

### **MITIGATION MEASURES**

There are no significant impacts; therefore no mitigation measures are required under NEPA.